

Amendments to the Drawings

Replacement drawing sheets are submitted herewith in order to label Figs. 38 and 43 as "Prior Art." In addition, replacement drawing sheets are submitted for Figs. 9, 12 and 13 in order to correct one of the reference numerals "40" to --44-- to correspond to Fig. 12 and the description in the specification. Also, a replacement drawing sheet is submitted herewith for Fig. 12 to provide a reference numeral "49" so as to show the "shaft 49" referred to on page 66 of the original specification. Further, a replacement drawing sheet is submitted herewith for Fig. 13 in order to correct the location of the lead line for reference numeral "44" so that the lead line corresponds to the lead line in Fig. 12.

Entry and approval of these replacement drawing sheets are respectfully requested.

REMARKS

By this amendment, claims 1-27 have been cancelled, and claims 28-36 have been added. Thus, claims 28-36 are now active in the application. Reexamination and reconsideration of the application are respectfully requested.

The specification and abstract have been carefully reviewed and revised to make grammatical and idiomatic improvements in order to aid the Examiner in further consideration of the application. The amendments to the specification and abstract are incorporated in the attached substitute specification and abstract. No new matter has been added.

Attached hereto is a marked-up version of the changes made to the specification and Abstract by the current amendment. The attachment is captioned "**Version with markings to show changes made.**"

In item 2 on page 2 of the Office Action, the Examiner indicated that Figs. 38 and 43 should be labeled as "Prior Art." Accordingly, replacement drawing sheets are submitted herewith in order to label Figs. 38 and 43 as "Prior Art." In addition, replacement drawing sheets are submitted for Figs. 9, 12 and 13 in order to correct one of the reference numerals "40" to --44-- to correspond to Fig. 12 and the description in the specification. Also, a replacement drawing sheet is submitted herewith for Fig. 12 to provide a reference numeral "49" so as to show the "shaft 49" referred to on page 66 of the original specification. Further, a replacement drawing sheet is submitted herewith for Fig. 13 in order to correct the location of the lead line for reference numeral "44" so that the lead line corresponds to the lead line in Fig. 12. Entry and approval of these replacement drawing sheets are respectfully requested.

In item 3 on pages 2 and 3 of the Office Action, the Examiner required a new title, and suggested that the title be changed to --COMPONENT INSERTION METHOD--. The Examiner's suggestion has been adopted.

In items 4 and 5 of the Office Action, claims 20-24 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite because the limitation "the pusher" at line 6 of claim 20 lacked proper antecedent basis. This rejection is believed moot in view of the cancellation of

claims 1-27. Furthermore, new claims 28-36 have been carefully drafted to avoid the problem noted by the Examiner and to otherwise clearly comport with the requirements of 35 U.S.C. 112, second paragraph.

In items 6-9 on pages 3-7 of the Office Action, claims 19 and 25-27 were rejected under 35 U.S.C. 103(a) as being unpatentable over Fujita et al. (U.S. 4,628,595) in view of Goumas et al. (U.S. 4,680,523*); claims 20, 23 and 24 were rejected under 35 U.S.C. 103(a) as being unpatentable over Fujita and Goumas et al. and further in view of Nishihara et al. (U.S. 4,944,086); and claims 21 and 22 were rejected under 35 U.S.C. 103(a) as being unpatentable over Fujita in view of Goumas and Nishihara and further in view of Wakamiya et al. (U.S. 4,833,776). These rejections are respectfully traversed and are believed clearly inapplicable to the claims as now presented, for the following reasons.

**The Goumas et al. reference was incorrectly indicated in item 7 on page 3 of the Office Action as being U.S. 4,690,523; whereas the Goumas et al. reference is properly U.S. 4,680,523. The reference number is properly indicated on the Form PTO-1449 listing the Goumas et al. reference.*

With exemplary reference to the present drawing figures, new independent claim 28 sets forth a component insertion method comprising: at a component grasping position, releasably grasping a first component 1, having a device portion 2 and a lead wire 3 at the device portion 2, by applying a first grasping pressure to the first component 1; while releasably grasping the first component 1, performing a first positional alignment in a direction along a surface of a board 6 to align the lead wire 3 and a first lead-wire insertion hole 6a of the board 6; after the performing of the first positional alignment, inserting the lead wire 3 of the first component 1 into the first lead-wire insertion hole 6a of the board 6; at the component grasping position, releasably grasping a second component 1, having a device portion 2 and a lead wire 3 at the device portion 2, by applying a second grasping pressure to the second component 1; while releasably grasping the second component 1, performing a second positional alignment in a direction along the surface of the board 6 to align the lead wire 3 of the second component 1 and a second lead-wire insertion hole 6a of the board 6; after the performing of the second positional alignment,

inserting the lead wire 3 of the second component 1 into the second lead-wire insertion hole 6a of the board 6; wherein the device portion 2 of the first component 1 is lower in rigidity than the device portion 2 of the second component 1; and wherein the releasably grasping of the first component 1 and the releasably grasping of the second component 1 are carried out such that the first grasping pressure applied to the first component 1 is lower than the second grasping pressure applied to the second component 1.

In contrast to the present invention of claim 28, and as recognized by the Examiner, although the Fujita et al. patent discloses a component insertion method for inserting lead wires of grasped components into insertions holes of a board, the Fujita et al. patent does not disclose or suggest that a grasping pressure for a second component is lower than a grasping pressure for a first component.

In fact, contrary to an assertion by the Examiner in the Office Action (see lines 5 and 6 of item 7 on page 3 of the Office Action) that Fujita et al. discloses “components including a first component (see Fig. 13) and a second component (see Fig. 12) lower in rigidity of the device portion than the first component,” the Fujita et al. patent clearly does not disclose or suggest a component insertion method for inserting a first and second component wherein the first component has a device portion with a lower rigidity than a device portion of the second component. That is, there is nothing in Figs. 12 and 13 of Fujita et al., or elsewhere in the drawings or specification that would suggest this feature requiring the insertion of first and second components, wherein the device portion of the first component is lower in rigidity than the device portion of the second component.

The Examiner cited the Goumas et al. reference for teaching “the grasping of variety of components (16) which [have] lead wire (see Fig. 2) at different [grasping] pressure for gripping the component without [deforming or destroying] the components (see col. 8, lines 3-15).” However, although the Goumas et al. patent mentions the ability to monitor gripping forces upon finger 14 (see column 7, lines 10-16), there is clearly no teaching or suggestion in the Goumas et al. patent of providing first and second components having device portions, wherein the rigidity

of the device portion of the first component is lower than the rigidity of the device portion of the second component, and further grasping these components with different grasping pressures such that the grasping pressure applied to the first component is lower than the grasping pressure applied to the second component. That is, the Goumas et al. reference mentions that body gripping creates problems for many automated assembly procedures because the relationships between the leads and the body are not always precisely defined. Thus, in Goumas et al., independent actuation of the fingers is adopted, by which the gripping assembly thereof can search for the size of a component having variable body-to-lead relationships and to center itself. However, the Goumas et al. patent is silent about controlling grasping pressure according to a rigidity of the device portion of a component.

The Examiner cited the Nishihara et al. patent for teaching a “pusher (17) that presses the component (12) [*sic*] predetermined pressure for each component and has the pressing pressure being controlled for preventing damaging or bending to the lead wire and/or the components.” The Examiner cited the Wakamiya et al. patent for teaching “bending the lead wire (4) of the component (4) after it [is] inserted into the board (5) while the component [is] being grasped and pushed by gripper and the pusher for securing the component to the board.” However, the Nishihara et al. and the Wakamiya et al. references clearly provide no teaching or suggestion that would have obviated the above-discussed shortcomings of the Fujita et al. and Goumas et al. references.

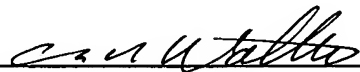
Thus, for the above reasons, it is believed apparent that the prior art references of record do not disclose or suggest, whether taken individually or in combination, the present invention as recited in present claim 28. Accordingly, it is respectfully submitted that claim 28, as well as claims 29-36 which depend therefrom, are clearly allowable over the prior art of record.

In view of the foregoing amendments and remarks, it is respectfully submitted that the present application is clearly in condition for allowance. An early notice thereof is earnestly solicited.

If, after reviewing this Amendment, the Examiner feels there are any issues remaining which must be resolved before the application can be passed to issue, it is respectfully requested that the Examiner contact the undersigned by telephone in order to resolve such issues.

Respectfully submitted,

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